Uniplex
CORPORATION

December 28, 1994

William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, NW Room 222
Washington, DC 20554

DEC 3 0 1994

Re: NPRM 93-61 Ex Parte

These comments are in response to the Ex Parte comments filed by Mobilevision, L. P. dated December 22, 1994.

Wideband Forward Link. Mobilevision implies that WBFLs were not contemplated in the Interim Rules with the statement, referring to the Pinpoint system, "If they had designed their system within the original constraints of the Interim Rules"..... In fact as we read the Interim Rules, it is difficult to see where a narrow band forward link is contemplated or allowed. For example, §90.239 (c) (1) states "Licensees for pulse ranging AVM systems requiring 8 MHz bandwidth may be authorized in the 904-912 MHz or 918-926 MHz band....." and §90.239 (e) (2) (i) states "The output power of transmitters used in pulse ranging AVM systems shall not exceed 1 kW PEP." The combination of such bandwidth and power clearly suggests a WBFL base station.

The Uniplex system employs a low duty cycle (less than 100:1) WBFL which permits an infinite number of mobiles and portables to calculate their position within the service area. Communication with mobiles is accomplished by a lower power bi-directional wide band link which is the limiting factor in the communications capacity of the network. Even when communication capacity is fully loaded, the network can still provide useful location services to users of other communication networks such as CDPD or users that don't require communication. Thus the Uniplex system is optimized for location services and not communication services which we suggest was the intent of the authors of the Interim Rules.

We are attaching an Ex Parte filing which was distributed at a meeting with Commission staff that further explains the characteristics, advantages and interference potential of our system.

Band sharing. Uniplex and Pinpoint have had discussions relative to band sharing as reported in earlier filings on the matter. The ways our technologies operate leads us to conclude that efficient sharing is feasible in our cases.

Interconnect services. We are on record with Mobilevision and Teletrac as supporting interconnect services. By means of clarification, we support the interconnection of our
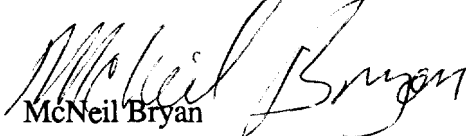
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wireless network to wireline services for the purpose of remotely controlling our base stations, relaying location requests and other data between our network and user host terminals and relaying such data between service areas. We did not contemplate that we were supporting the provision of "cellular like" or "PCS like" voice data services as we consider such to be in conflict with our understanding of the intended use of this spectrum.

Conclusion. Uniplex has spent six years and millions of dollars designing a location system that it believes meets the letter and spirit of the Interim Rules more closely than most other LMS systems involved in this proceeding. We recognize that we, like others, may have to revise our design to accommodate a new band plan but we do not believe the Commission should penalize us by not providing for, at least limited, WBFL operation. Further, we ask that the Commission provide for an auction free shared band for our operations or liberal grandfathering provisions for our operation. We have would have not risked the considerable investments in time and money required to develop our system had we known that the rules on which we relied would become so volatile.

Sincerely,

UNIPLEX CORPORATION

McNeil Bryan

President

SpyderNet™

By·Uniplex® Corporation

The Uniplex SpyderNet Wireless Distributed Intelligence Location and Communications Network (WDILCN) consists of an array of fixed point spread spectrum transceivers linked to a central network management computer which is in turn linked to multiple customer computers. Mobile and portable devices use the network array to communicate location and other data with their respective customer computers.

The SpyderNet system is unique in that instead of storing current and historical location data in a central database or customer database, each SpyderNet Mobile or portable computes and stores its own location histogram. This requires that fixed stations periodically transmit a "Token" data packet among themselves which mobiles overhear and use to compute their position. In the process of measuring timing differences between fixed points for position determination, the mobiles also receive outbound messages or service requests, road traffic updates, the relative signal strength of nearby fixed points and other network protocols without creating any inbound radio traffic unless requested.

To accomplish radiolocation passively, the system requires an overhead of 5-10% of total system time to assure a reasonable chance that mobiles within the coverage area receive 3 or more pairs of fixed points during the Token passing session. To initiate a service request or reply to one, a mobile establishes contact with the fixed point having the strongest signal during the last Token passing session. Thus, mobile power requirements are less than narrowband forward link systems which must reach multiple fixed points for multilateration.

Although the Token passing overhead may seem high from our system perspective, from an interference point of view, any fixed point transmitter will not likely have a duty cycle greater than 1:100. Additionally, at least for some classes of potential customers, a distributed intelligence system like SpyderNet results in superior service with far less radio traffic than would be necessary with a central intelligence system.

Consider the case of a metropolitan transportation system with 500 buses. If the requirement is that central dispatch be alerted to all instances of busses running 2 minutes or more off schedule, a central intelligence system would have to query all 500 buses every 2 minutes. With the Uniplex SpyderNet distributed intelligence system, each bus would have its own on-board computer with it's stored schedules. Every 20 seconds or so, when a position fix is received, it would make an on-time determination and only report behind schedule by exception to the central dispatch.

A home prisoner monitoring bracelet could operate in a similar manner when miniaturized low power consumption hardware is developed. Presently such systems consist of low power transmitters worn as a leg or arm bracelet and a home unit that simply reports via telephone that the person has gone out of range. Courts are reluctant to sentence many cases to this type of system because there is no control of the person's whereabouts when he leaves home for an authorized period to go to work, attend AA meetings etc.

With the SpyderNet distributed intelligence approach, the prisoner's bracelet would be loaded with his weekly itinerary which would be periodically compared with position fixes obtained from SpyderNet. Should the prisoner deviate from the allowed schedule he will be warned by the bracelet and the bracelet, in turn will report the exception via the SpyderNet network.

SpyderNet System Parameters

Fixed Site Antenna Spacing	1-3 miles urban 10-15 miles suburban/rural

Signal Characteristics Base and Mobile

Bandwidth	8 MHz
Chip Rate	4 MHz
Code Length	127 Chips
Modulation	QPSK Two Bits Per Symbol 31.25 KHz Symbol Rate
Data Rate	19.2 KBd
Design Receive Level	-110 dbm (Quiet) -95 dbm (Normal Background Noise)
Packet Structure	5 ms Preamble (Chip Code) 16 to 1024 Byte Data packet Including Overhead
Interference Avoidance	CSMA and Course TDMA
Error Management	CRC and Byte Check
Min Fixed Sites For Location Fix	3 Pairs (Passive Hyperbolic Multilateration)

Fixed Station Parameters

Typical Antenna Height	50-300 ft
Power	6-300 Watts EIRP Adaptive Power Control
Transmit Duration	7-21 ms
Transmit Periodicity/Site	3-6 Every 30 Seconds Token Passing Full Power 1/Hr Nearest Mobile, Adaptive Power Control

Mobile/Portable Parameters

Power	20 Watts
Antenna Gain	-3 dbi to +6 dbi
Transmit Duration	7-21 ms
Periodicity	0 to 1/Hr est.